WHAT IS CLAIMED IS:

1. A mirror retainer for retaining a mirror accommodated in a chamber that has a wall and a lid openably provided on the wall, and generates a reduced pressure environment, said mirror retainer comprising an elastic member for connecting the mirror elastically to the lid.

2. The mirror retainer according to claim 1, further comprising a cooling plate, connected to the mirror between the lid and the mirror, for cooling the mirror.

3. The mirror retainer according to claim 2, further comprising a cooling tube, located between the lid and the mirror, for providing coolant to said cooling plate via the lid.

4. The mirror retainer according to claim 2, wherein said elastic member is connected to said cooling plate and the mirror via said cooling plate.

5. The mirror retainer according to claim 1, further comprising a positioning mechanism for positioning the mirror so as to restrict six axes of the mirror.

6. The mirror retainer according to claim 5, wherein said positioning mechanism includes:

three first fixing shafts connected to the mirror; and

three second fixing shafts engaged with said first fixing shafts and provided in the chamber,

wherein one of the three first fixing shafts and the three second fixing shafts have a spherical tip, and the other have a V-shaped groove tip, a cone groove tip, and a flat tip.

7. The mirror retainer according to claim 5, further comprising a cooling plate, connected to the mirror located between the lid and the mirror, for cooling the mirror,

wherein said positioning mechanism includes:

three first fixing shafts connected to the cooling plate and the mirror via the cooling plate; and

three second fixing shafts engaged with the first fixing shafts and provided in the chamber,

wherein one of the three first fixing shafts and the three second fixing shafts have a spherical tip, and the other have a V-shaped groove tip, a cone groove tip, and a flat tip.

8. A method for retaining a mirror accommodated in a chamber that has a wall and a lid openably

provided on the wall, and generates a reduced pressure environment, said method comprising the steps of:

connecting the mirror elastically and exchangeably to the lid, and

positioning the mirror by keeping the mirror in contact with a fixing member provided in the chamber independent to the chamber.

9. A method for exchanging a mirror accommodated in a chamber that has a wall and a lid openably provided on the wall, and generates a reduced pressure environment, said method using a mirror retainer that includes an elastic member for connecting the mirror elastically to the lid, and a positioning mechanism, provided in the chamber, for positioning the mirror, said method comprising the steps of:

opening the chamber to atmospheric pressure;

taking the mirror out of the chamber simultaneous with opening of the lid opens;

exchanging the mirror;

closing the lid simultaneous with introducing of the mirror into the chamber and positioning the mirror using the positioning mechanism; and

drawing a vacuum in the chamber.

10. An illumination apparatus for illuminating a mask that forms a pattern, said illumination apparatus

being used for a chamber that has a wall and a lid openably provided on the wall, and generates a reduced pressure environment, said illumination apparatus comprising:

a mirror, accommodated in the chamber and provided near an emission point of a light source for generating light from the plasma, for condensing the light; and

an elastic member that connects the mirror elastically to the lid.

11. An illumination apparatus according to claim 10, wherein the light is the EUV light or x-ray.

12. An exposure apparatus comprising:

a chamber that has a wall and a lid openably provided on the wall, and generates a reduced pressure environment;

an illumination apparatus for illuminating a mask that forms a pattern; and

a projection optical system for projecting the pattern onto an object to be exposed,

wherein said illumination apparatus includes:

a mirror, accommodated in the chamber and provided near an emission point of a light source for generating light from the plasma, for condensing the light; and

an elastic member that connects the mirror elastically to the lid.

13. An exposure apparatus according to claim 12, wherein the light is the EUV light or x-ray.

14. A device fabrication method comprising the step of:

exposing an object to be exposed, using an exposure apparatus; and

performing a predetermined process for the object exposed,

wherein an exposure apparatus includes:

a chamber that has a wall and a lid openably provided on the wall, and generates a reduced pressure environment;

an illumination apparatus for illuminating a mask that forms a pattern; and

a projection optical system for projecting the pattern onto an object to be exposed,

wherein said illumination apparatus includes:

a mirror, accommodated in the chamber and provided near an emission point of a light source for generating light from the plasma, for condensing the light; and

an elastic member that connects the mirror elastically to the lid.

15. A device fabrication method according to claim 14, wherein the light is the EUV light or x-ray.